

Application No. 10/630,478
Amdt. Dated December 13, 2006
Reply to Office Action of June 13, 2006

Amendment to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims:

1. (Currently amended) A method of expansion of bone tissue for receiving a dental implant comprising the steps of:

(a) creating an initial osseotomy site in the maxilla or the mandible to a desired depth by drilling using a pilot drill at a predetermined implant location; said initial osseotomy site having a first diameter substantially smaller than an outer diameter of said dental implant;

(b) providing multiple threaded expanders of substantially same structure with increasing diameters, each of said threaded expanders comprising: a top enabling engagement with a dental ratchet; a cylindrical shaft having an upper and a lower end, having depth markings along a longitudinal axis of said shaft; and a threaded expansion tip connected to said lower end of said cylindrical shaft; said threaded expansion tip of each of said multiple threaded expanders having a same length and a substantially same threaded structure to a threaded structure of said dental implant, yet a narrower outer diameter than said outer diameter of said dental implant;

(c) screwing said threaded expansion tip of a first threaded expander into said initial osseotomy site, thereby expanding said initial osseotomy site laterally by pushing bone tissue away radially from a longitudinal axis of said initial osseotomy site, to obtain an once expanded osseotomy site that has a second diameter larger than said first diameter of said initial osseotomy site;

(d) allowing said threaded expansion tip of said first expander staying in said once expanded osseotomy site for a sufficient amount of time to impress an interior wall of said once expanded osseotomy site to form grooves and threads;

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(e) retrieving said first expander by screwing said threaded expansion tip of said first expander out in a reverse direction; and

(g) repeating steps (c) to (e) using a second threaded expander which has an increasing outer diameter and a substantially same threaded structure to said dental implant, starting by following a thread pattern created in steps (c) to (e), to further expand said second diameter of said once expanded osseotomy site laterally to a final diameter to obtain a twice expanded osseotomy site, that wherein both said said grooves and threads are expanded substantially from said first diameter of said initial osseotomy site; and said twice expanded osseotomy site has a complementary geometry to said dental implant, but and both said grooves and said threads on an said interior wall of said twice expanded osseotomy site are uniformly narrower than outer diameters of complementary elements of said dental implant so that said twice expanded osseotomy site enables said implant to sufficiently bite into and uniformly engage with surrounding bone tissues.

2. (Previously presented) The method of Claim 1 further comprising screwing said dental implant into said twice expanded osseotomy site after step (g), starting by following said thread pattern created by said expanders.

3. (Previously presented) The method of Claim 1, wherein in step (d) said sufficient amount of time is from about 10 seconds to about 2 minutes.

4. (Previously presented) The method of Claim 3, wherein in step (g) said final diameter is from about 0.2 to about 0.5 mm narrower than said outer diameter of said dental implant.

5. (Previously presented) The method of Claim 4 further comprising an additional step of repeating step (g) using a third threaded expander having an increasing outer diameter from said second expander to further expand said twice osseotomy site.

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6-7. Canceled.

8. (Previously presented) The method of Claim 4, wherein said first diameter of said initial osseotomy site is in a range from about 1.5 mm to about 2.5 mm obtained using said pilot drill having a matching diameter.

9. (Previously presented) The method of Claim 8, wherein a first expansion achieved by said first expander expands said initial osseotomy site by about 0.2 to about 0.5 mm in diameter to obtain said second diameter of said once expanded osseotomy site.

10. (Previously presented) The method of Claim 9, wherein a second expansion, achieved by using said second expander expands said once osseotomy site by about 0.6 mm to about 1.2 mm in diameter to obtain said final diameter of said twice expanded osseotomy site.

11. (Original) The method of Claim 1, wherein said screwing said expanders into said osseotomy site is performed using a ratchet.

12. (Previously presented) A method of expansion of bone tissue for receiving a dental implant comprising the steps of:

(a) creating an initial osseotomy site in the maxilla or the mandible to a desired depth by drilling using a pilot drill at a predetermined implant location; said initial osseotomy site having a first diameter substantially smaller than an outer diameter of said dental implant;

(b) applying an additional drilling to extend an entrance of said osseotomy site only at a cortical level to a diameter complementary to an outer diameter of said dental implant;

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(c) screwing a threaded expansion tip of a first threaded expander into said initial osseotomy site, thereby expanding said initial osseotomy site laterally by pushing bone tissue away radially from a longitudinal axis of said initial osseotomy site, to obtain an once expanded osseotomy site that has a second diameter larger than said first diameter of said initial osseotomy site;

(d) allowing said threaded expansion tip of said first expander staying in said once expanded osseotomy site osseotomy site for a sufficient amount of time to impress an interior wall of said once expanded osseotomy site to form grooves and threads;

(e) retrieving said threaded expansion tip of said first expander by screwing out in a reverse direction; and

(f) repeating steps (c) to (e) using a second threaded expander which has an increasing outer diameter and a substantially same threaded structure to a threaded structure of said dental implant, starting by following a thread pattern created in steps (b) to (d), to further expand said once osseotomy site laterally to a final diameter to obtain an a twice expanded osseotomy site that has a complementary geometry to said dental implant, but narrower than said outer diameter of said dental implant so that said twice expanded osseotomy site enables said implant to sufficiently bite into and uniformly engage with surrounding bone issues.

13. (Previously presented) The method of Claim 12 further comprising placing said dental implant into said twice expanded osseotomy site after step (f), starting by inserting said dental implant through said cortical level of said osseotomy site and screwing into rest of said twice expanded osseotomy site by following said thread pattern created by said expanders.

14. (Original) The method of Claim 12, wherein in step (d) said sufficient amount of time is from about 10 seconds to about 2 minutes.

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15. (Original) The method of Claim 14, wherein in step (f) said final diameter is from about 0.2 to about 0.5 mm narrower than said outer diameter of said dental implant.

16. (Previously presented) The method of Claim 15 further comprising an additional step of repeating step (f) using a third threaded expander having an increasing outer diameter from said second expander to further expand said twice expanded osseotomy site laterally.

17. (Previously presented) The method of Claim 16, wherein said threaded expansion tip of said first, second and third expanders has a same length.

18. Canceled.

19. (Previously presented) The method of Claim 12, wherein each of said expanders has a substantially same threaded structure to said dental implant for preparing a complementary geometry of said osseotomy site for receiving said dental implant.

20. (Previously presented) The method of Claim 12, wherein each expansion achieved by one of said expander expands said osseotomy site from about 0.6 mm to about 1.5 mm in diameter.

21. (Previously presented) A kit of bone expanders for expanding bone for receiving a dental implant, comprising a plurality of threaded expanders of substantially same structure with increasing diameters, each of said expanders comprising:

- (a) a top enabling engagement with a dental ratchet,
- (b) a cylindrical shaft having a upper and a lower end, having depth markings along a longitudinal axis of said shaft,

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(c) a transition between said upper end of said cylindrical shaft and said top, and

(d) a threaded expansion tip connected to said lower end of said cylindrical shaft, said tip having a substantially same threaded structure to a threaded structure of said dental implant, ~~but a narrower outer diameter than an outer diameter and~~ having diameters uniformly narrower than those of corresponding elements of said dental implant,

wherein said threaded expansion tip of each of said plurality of expanders has a same length.

22. Canceled.

23. (Original) The kit of bone expanders of Claim 22, wherein said threaded expansion tip is tapered.

24. (Original) The kit of bone expanders of Claim 22, wherein said threaded expansion tip is straight.

25. (Currently amended) A method of expansion of bone tissue for receiving a dental implant comprising the steps of:

(a) creating an initial osseotomy site in the maxilla or the mandible to a desired depth by drilling using a pilot drill at a predetermined implant location; said initial osseotomy site having a first diameter substantially smaller than an outer diameter of said dental implant;

(b) screwing a threaded expansion tip of a first threaded expander into said initial osseotomy site, thereby expanding said initial osseotomy site radially to obtain an once expanded osseotomy site that has a second diameter larger than said first diameter of said initial osseotomy site by about 0.2 to about 0.5 mm;

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(c) allowing said threaded expansion tip of said first expander staying in said once expanded osseotomy site for a sufficient amount of time to impress an interior wall of said once expanded osseotomy site to form grooves and threads;

(d) retrieving said first expander by screwing said threaded expansion tip of said first expander out in a reverse direction; and

(e) repeating steps (b) to (d) using a second threaded expander which has an increasing outer diameter and a substantially same threaded structure to said dental implant, starting by following a thread pattern created in steps (b) to (d), to further expand said once expanded osseotomy site radially by about 0.6 mm to about 1.2 mm in diameter to obtain a twice expanded osseotomy site that, wherein both said grooves and said threads are expanded substantially from said first diameter of said initial osseotomy site; and said twice expanded osseotomy site has a complementary geometry to said dental implant, but and both said grooves and said threads on an said interior wall of said twice expanded osseotomy site are uniformly narrower than ~~outer~~ diameters of complementary elements of said dental implant.